Foreign Direct Investment and Learning Regions: Development in New EU Member Countries

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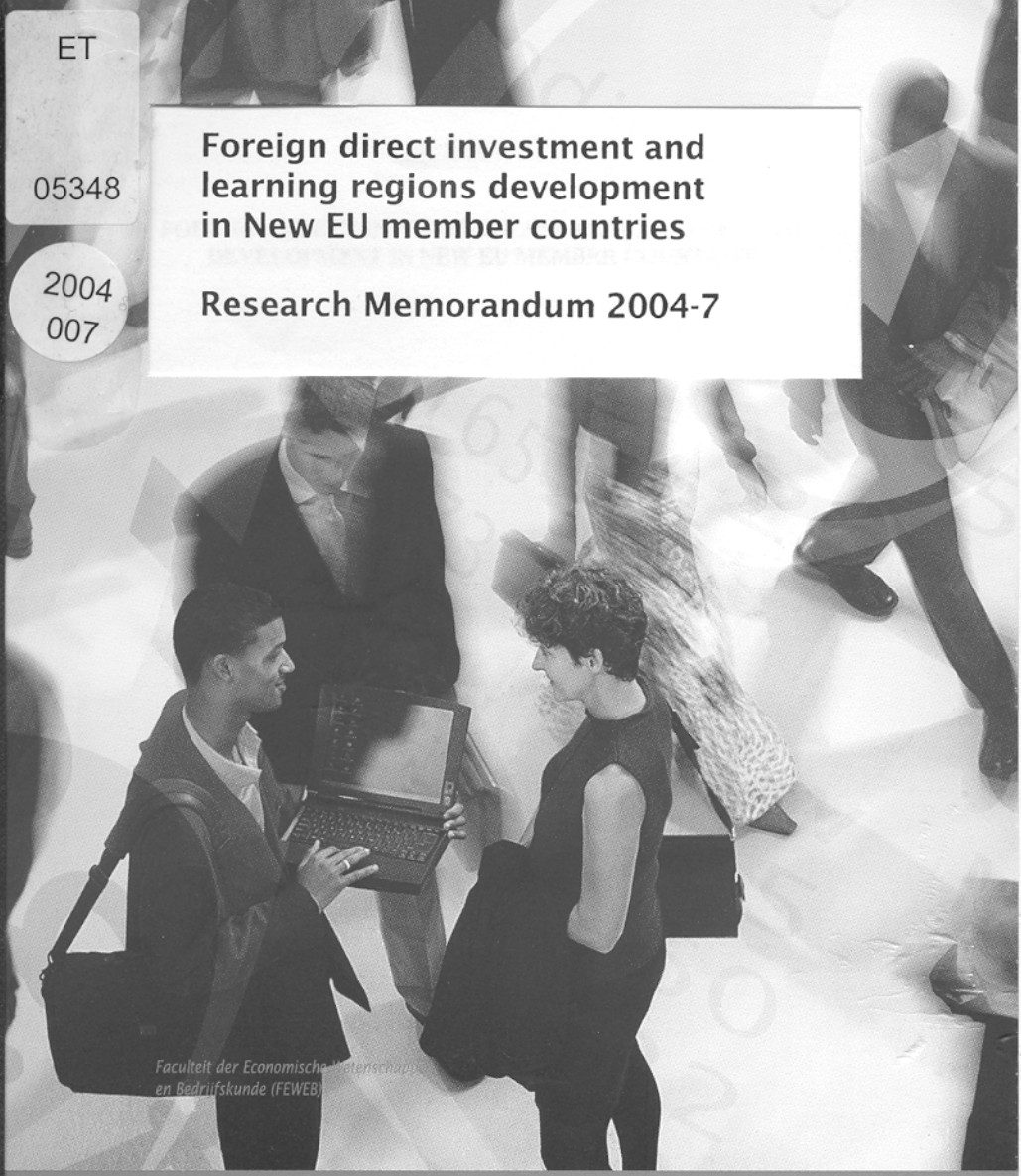

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Research Memorandum 2004-7

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FOREIGN DIRECT INVESTMENT AND LEARNING REGIONS DEVELOPMENT IN NEW EU MEMBER COUNTRIES

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Abstract

In this study we address the potential rise of innovative regions in Central and Eastern Europe by connecting the interests of foreign investors and the interests of recipient regions as learning regions. Our exploratory results give a rather pessimistic picture in that enhancing the innovative level of the regional economy seems limited to those cases where there is already an existing system of innovative suppliers in the region and where this system can be used within the strategy of the foreign investor. The preliminary observations indicate a need for a general policy to acquire and absorb new knowledge, as well as targeted policy measures to benefit from foreign direct investment in terms of knowledge spillovers into the regional economy.

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1. Setting the Scene

In Central and Eastern Europe investment from abroad is often seen as a catalyst for socio-economic improvement and as an important source of alternative finance for the transformation of former state-owned enterprises, the latter in the absence of large domestic savings and limited access to international capital markets (cf. Svetlicic and Rojec, 1994; Meyer, 1995). In addition, foreign direct investment (FDI) is increasingly considered to be a way of knowledge transfer to enhance the introduction of innovative products, new production processes, and management skills (e.g. Bell, 1997), but addressing the acquisition of western technology by firms in Central and Eastern Europe as a policy issue at its own right is relatively new. This is particularly true for the regional level and regional policies (e.g. van Geenhuizen, 2001).

FDI in transition economies has been extensively analysed in the literature with regard to size of flows, number of projects, location-specific barriers, and geographical distribution (e.g. Dunning, 1993; Meyer, 1995; van Geenhuizen and Nijkamp, 1996, 1998). There is now a an increased recognition of the need for research on the way how regional economies may benefit from investment impacts - through active learning and spill-over effects - and become more competitive (e.g. Svetlicic and Rojec, 1994; Hooley et al., 1996; OECD, 1996a; Pavlínek and Smith, 1998; Smith and Ferenciková, 1998). Thus, the key questions are not only concerned with changes in size of investment flows but also with motivations of foreign investors to operate a subsidiary (joint venture) in Central and Eastern Europe, the extent to which the investments create local forward and backward linkages and knowledge transfer to domestic firms, and integrate endogenous knowledge.

Our approach in exploring impacts of FDI on the innovative level of regional economies is the one of learning regions (e.g. Morgan, 1997; Morgan and Nauwelaerts, 1999) or the "active space" approach (van Geenhuizen and Ratti, 2001). One reason is the strong emphasis in this approach on institutional conditions for learning and innovation, like networks of supportive organisations such as universities, chambers of commerce, R&D institutes and intermediary organisations. In addition, localized learning mechanisms and learning processes are seen as essential for innovation, underpinned by a mutual understanding and confidence among major stakeholders on problems shared in the regional economy. It is this institutional "seedbed" that needs to be present to benefit from potential knowledge spillovers from FDI in the regional economy.

The structure of the paper is as follows. First, the size of FDI flow and FDI stock is investigated for each country, with a special focus on the countries that join the EU in 2004 (Section 2). Attention is also paid to differences in investment on the regional level. Then the focus of analysis shifts to factors underlying differences in attraction between countries, particularly their stage of transition and institutional proximity to the EU (Section 3). In the next section, we outline entrepreneurial motives behind FDI and the broader corporate strategies involved, using various original case studies and studies from the literature (Section 4). The more general conditions for technology acquisition, learning and innovation, as set by the national systems of innovation, are the next subject we discuss (Section 5). Against this background, entrepreneurial motives and strategies of foreign investors are linked to potentials for regional embeddedness of foreign subsidiaries and concomitant knowledge spillovers in the

regional economy (Section 6). We conclude the chapter with some recommendations for policy action and future research.

2. The Geography of FDI

There is quite some differentiation in FDI inflow on the country level. With an inflow of almost 15 billion US$ over the past two years FDI is largest in the Czech Republic. Poland holds a second position (almost 10 billion US$), with Slovakia and Russia as third and fourth (between 4 and 5 billion US$) (*Table 1*). The rank order of countries in terms of FDI stock – broadly seen as accumulated flow in the past years – may be slightly different, due to for example differences in year of take-off of FDI and in reaching a complete privatisation. For example, Hungary has been the leading recipient country since the lifting of the iron curtain in 1989, but lost this position towards the end of the 1990s due to near completion of the privatisation. In terms of FDI stock in 2002 we find Poland in first place, followed by the Czech Republic, Hungary and Russia. FDI stock in Central and Eastern Europe (CEEC) is heavily concentrated in countries adjacent to Western Europe, i.e. approximately 80% in total. This was true in1996 (van Geenhuizen, 2001) and remains true in 2002 (see also Resmini and Traistaru, 2003). Poland (29.3%), the Czech Republic (25.0%) and Hungary (15.9%) are largely responsible for this pattern.

Table 1 FDI in Central and Eastern Europe (CEEC) and parts of CIS

Country	Inflow *		FDI stock 2002 *	FDI stock 2002 as share in GDP (%)
	2001	2002		
Albania	207	213	988	21.0
Bulgaria	813	479	3889	24.0
Croatia	1561	981	6029	28.4
Czech Rep.	5639	9319	38450	54.8
Estonia	542	307	4226	65.9
Hungary	2440	854	24416	38.2
Latvia	164	396	2723	32.4
Lithuania	446	732	3981	31.4
Poland	5713	4119	45150	23.9
Romania	1157	1106	8786	20.5
Slovakia	1579	4012	10225	43.2
Slovenia	503	1865	5074	23.1
Total CEEC	*20764*	*24383*	*153937*	
Belarus	96	227	1602	11.2
Moldova	156	111	717	45.0
Russia	2469	2421	22563	6.5
Ukraine	792	693	5355	n.a.

* Million US$. Serbia, Bosnia-Herzogevina, Macedonia, and ex-Soviet republics in Asia excluded.
Source: World Investment Report 2003 (UNCTAD, 2003).

The above indicated patterns suggest that the first countries to enter the EU in 2004, particularly the larger ones (Poland, Hungary, the Czech Republic and Slovakia) have

attracted large amounts of FDI in the past decade. In terms of causality, it remains unknown to what extent this happened just because these countries had already reached advanced stages of transition or because of the attractiveness of future membership of the EU.

If we consider FDI in relative terms, i.e. as share in Gross Domestic Product (GDP) per country, the picture is different from the one above. With shares between 65 and 40% FDI is relatively large for Estonia, the Czech Republic, and Slovakia. Remarkably, with a low absolute level of FDI inflow, Moldova also turns out to have a large share of FDI stock in GDP (45.0%). In most economies in Central and Eastern Europe the share of FDI stock in GDP is between 20 and 40%. Russia, although receiving large amounts of FDI, turns out to be an economy with a small share of FDI in GPD (6.5%).

The regional dimension of FDI was often neglected in the first years of the transition because all the attention was attracted to problems of macro-economic stabilisation. Despite a lack of comparable regional data on FDI, there seems sufficient indication for an ongoing trend of reinforcing existing regional disparities. Thus, FDI inflow concentrates in the borderlands with the EU and in the large metropolitan areas (e.g. Gorzelak, 1996; van Geenhuizen and Nijkamp, 1998; Hardy, 1998; Pavlínek and Smith, 1998; Petrakos, 2001). For example, Warsaw has received 35% of all inflow into Poland and Bratislava 60% of all inflow into the Slovak Republic. In contrast, many regions - often in the eastern parts – have received limited FDI or none. However, this process is not uniform across economic sectors and over time (Altomonte and Resmini, 2002). This can be illustrated with the car industry in Poland facing investments in almost all parts of the country.

3. Factors Underlying Aggregate FDI Patterns

The spatial patterns of FDI partly reflect the influence of the state of transition, i.e. progress made in the development of a new system for the generation and allocation of resources, with private production and well-functioning markets as corner-stones (Svetlicic and Rojec, 1994; Meyer, 1995; Gorzelak, 1996; Lankes and Venables, 1997, van Geenhuizen, 2001). A major component of this transition is the change and creation of institutions, including enterprises and legal structures (EBRD, 1996).

In considering the influence of the stage of transition on FDI patterns, it is now increasingly realised that transition is *not a linear* process, but a development with ups and downs, spurts and stops, regarding the different dimensions. For example, Bulgaria and Romania suffered serious macro-economic setbacks in 1997, but the crises triggered the emergence of new governments that have begun to implement bold programs of stabilisation and structural reform (EBRD, 1997). In addition, transition does not follow one particular trajectory, but various different ones, dependent upon the interplay of generic macro-economic trends and local specificity. It is, therefore, difficult to make generalisations valid for the entire area of Central and Eastern Europe.

Towards the end of the 1990s the stage of transition is clearly different between countries according to indicators concerning enterprises, markets, financial

institutions, and the legal system, but all have moved away from the initial stage in which primary emphasis was placed on reforms aimed at establishing markets and private ownership (*Table 2*). The more advanced stages are observed in the Czech Republic, Hungary, Poland, Slovakia, and Slovenia, as well as the Baltic States (Estonia, Latvia, and Lithuania). In this grouping Croatia is a borderline case. Countries in an advanced stage have pursued comprehensive market-oriented reform since the late 1980s or early 1990s. Gross Domestic Product (GDP) is generated mainly from the private sector, witness a share of 65 to 75% in most cases. The most extensive privatisation programs have been implemented in the Czech Republic, Estonia and Hungary (EBRD, 1996). Having privatised most of their manufacturing enterprises, the two latter countries are now focusing on privatisation in the banking sector, infrastructure, and public utilities. In Latvia, Poland, Croatia and Slovenia large scale privatisation has lagged somewhat behind other areas of reform, although progress has been made now in all four countries. Poland's long-delayed mass privatisation program is now in implementation for a few years.

Table 2 Progress in transition in Central and Eastern Europe and parts of CIS based on selected indicators (1997) (a) (b)

Country	Private Sector	Enterprises			Markets (trade)			Financial		
		A	B	C	D	E	F	G	H	I
Albania	75	2	4	2	3	4	2	2	2-	2
Bulgaria	50	3	3	2+	3	4	2	3-	2	3
Croatia	55	3	4+	3-	3	4	2	3-	2+	4
Czech Rep.	75	4	4+	3	3	4+	3	3	3	4
Estonia	70	4	4+	3	3	4	3-	3+	3	4
Hungary	75	4	4+	3	3+	4+	3	4	3	4
Latvia	60	3	4	3-	3	4	3-	3	2+	3
Lithuania	70	3	4	3-	3	4	2+	3	2+	3
Poland	65	3+	4	3	3	4+	3	3	3+	4
Romania	60	3-	3	2	3	4	2	3-	2	3
Slovakia	75	4	4+	3-	3	4	3	3-	2+	3
Slovenia	50	3+	4+	3-	3	4+	2	3	3	3
Belarus	20	1	2	1	3	1	2	1	2	2
Moldova	45	3	3	2	3	4	2	2	2	2
Russia	70	3+	4	2	3	4	2+	2+	3	3
Ukraine	50	2+	3	2	3	3	2	2	2	2

a. Serbia, Bosnia-Herzogevina and Macedonia, and ex-Soviet republics in Asia excluded.

b. Indicators A-I stand for: A = Large-scale privatisation; B = Small-scale privatisation; C = Enterprise restructuring; D = Price liberalisation; E = Trade and foreign exchange system; F = Competition policy; G = Banking reform and interest rate liberalisation; H = Securities markets and non-bank financial institutions; I = Extensiveness and effectiveness of pledge law, bankruptcy and company law. Ratings from 1 to 4+ (with 4+ for most advanced economies).

Source: van Geenhuizen 2001 (adapted from EBRD 1997).

The countries at less advanced stages of transition include Albania, Belarus, Bulgaria, Romania, Moldova, Russia and Ukraine (*Table 2*). They have all moved decisively to principles of market competition, but they are less advanced in enterprise restructuring

(indicator C) and reform of financial institutions (particularly indicator G). In 1997, Bulgaria and Romania restarted once lagging mass privatisation schemes, as well as direct sales of large enterprises. The private sector share in most of the countries listed below falls between 45 and 60% of GDP.

Note that Russia holds a unique position, being alone for its sheer size. Problems of transition are different here from those in Central and Eastern Europe because private trade was eliminated a quarter of a century earlier, meaning that industrialisation took place almost from the beginning under the communist command economy, causing the absence of any roots (experience) in private ownership in manufacturing at the beginning of the transformation. Russia started the implementation of a reform scheme in 1992, involving price and trade liberalisation, small-scale privatisation, and unification of the exchange rate, however, fiscal and credit policies remained modest in their impact, and monetary policy was not able to stabilise the exchange rate of the rouble for a number of years.

Aside from the stage of transition, FDI at the country level also reflects the influence of geographical and cultural proximity to major investing countries, the latter e.g. based on political ties in history and more recent flows of toerism. In the EU, Germany is by far the largest source of investment while showing a large preference for investing in countries like Hungary, Poland and the Czech Republic, based on short distances and a certain cultural similarity. The same holds for Austria, with important investments in adjacent Hungary, Czech Republic, Slovakia, and Slovenia (Alzinger and Winklhofer, 1998; Meyer, 1995; van Geenhuizen and Nijkamp, 1998). Today, this situation has changed somewhat. Already for some years, Germany is putting strong efforts into reunification and internal economic problems, at the same time that an important investing country has entered the field, i.e. the Republic of Korea. In 1996, for example, Korea became the largest investor in Poland, e.g. with planned investments by Daewoo of 1,1 billion US$.

In the remaining section we try to estimate "distance impacts" on the inflow of FDI, including both institutional distance (based on the stage of transition) and geographical and cultural distance. In a "quasi-experimental approach" we compare pairs of recipient countries which are roughly similar in size of the domestic economy, but different in distance. The countries facing a relatively small distance are the ones identified above as the most advanced in transition, i.e. Czech Republic, Hungary, Poland, Slovakia, Slovenia, the three Baltic states, and Croatia as a border case. These are without exception also countries at close geographical and cultural distance from the EU. We distinguish between two periods, i.e. 1989-1995 and 1996-2002, since we think that countries that were most advanced in transition and highly attractive for FDI in earlier years might show signs of a completed privatisation later on.

The results based on FDI stocks using 14 pairs of countries are given in *Table 3*. The countries facing a large institutional distance are Bulgaria, Belarus, Romania, Ukraine, Moldova, and Albania. The table shows a pair-wise comparison of the absolute size of FDI stocks of similar countries – in terms of size of the economy - and the concomitant reduction levels in FDI. A reduction level of 10.1%, for example, means a diminishing influence of institutional distance on cumulative FDI to 10.1%. Of

course, this is a rough estimate because some more factors may influence the size of FDI flow to a country, like individual policies of recipient countries to attract FDI and the political atmosphere, causing some "noise" in the outcomes.

We observe a reduction in all cases but there is a large differentiation in the level, i.e. ranging from almost absence of FDI (0.7%) to a reduction by less than half (57.1%) in the first period. In these years, reduction is most dramatic for Belarus and Bulgaria, i.e. a level lower than 10%. It is least dramatic in the case of Albania, i.e. a reduction to a level between 60% and 10%.

Table 3 Reduction in FDI stocks (inwards)

Pairs of countries	1995 FDI stocks (million US$)	Reduction Level	2002 FDI stocks (million US$)	Reduction Level
Czech Rep. – Bulgaria	7350 – 446	6.1%	38450 – 3889	10.1%
Czech Rep. – Belarus	7350 - 50	0.7%	38450 – 1602	4.2%
Hungary - Bulgaria	11919 – 446	3.7%	24416 – 3889	15.9%
Hungary - Belarus	11919 - 50	0.4%	24416 – 1602	6.6%
Poland - Romania	7843 – 821	10.5%	45150 – 8786	19.5%
Poland - Ukraine	7843 – 910	11.6%	45150 – 5355	11.9%
Lithuania - Moldova	352 - 93	26.4%	3981 – 717	18.0%
Slovakia - Moldova	810 - 93	11.5%	10225 – 717	7.0%
Latvia – Moldova	615 - 93	15.1%	2723 – 717	26.3%
Lithuania – Albania	352 – 201	57.1%	3981 – 988	24.8%
Slovenia - Albania	1763 – 201	11.4%	5074 - 988	19.5%
Latvia - Albania	615 – 201	32.7%	2723 - 988	36.3%
Croatia – Albania	478 - 201	42.1%	6029 - 988	16.4%
Croatia – Moldova	478 - 93	19.5%	6029 - 717	11.9%

Source: Adapted from UNCTAD World Investment Report 2003.

If we consider developments over time, various differences become clear. Some countries improve their performance, i.e. Bulgaria and Belarus, both starting from a very modest level, and Romania. Others, however, show a decreasing performance over time in various comparisons, i.e. Moldova and Albania. To conclude, our data illustrate a large diminishing influence of institutional distance on the amount of FDI, be-it that this impact is differentiated between countries and time-periods.

4. Foreign Investors and their Strategies

Foreign direct investment is the transfer by a firm of capital (and other resources) into a business venture abroad, aimed at acquiring control of the venture. Although motivation for FDI in transition economies tends to be mixed, four broad types of FDI can be distinguished according to the dominant motive:

- efficiency or cost-based, aimed at cheap inputs, like low wages, and labour market flexibility
- market-driven, aimed at the penetration of new markets
- resource-based, aimed at the exploitation of (cheap) natural resources
- knowledge-based, aimed at the use of specialist (cheap) knowledge.

To date, market-driven motives and cost-based motives dominate inward FDI in Central and Eastern Europe (EBRD, 1994; Welfens and Jasinski, 1994; Meyer, 1995; Radosevic, 1997). Some authors have seen a gradual increase in the importance of cost-based FDI connected with declining standards of living and consumption in particular countries, and a slower market growth than expected. Accordingly, an increasing factor in investment decisions is access to the relatively low-wage but often medium-skill workforce (e.g., Smith and Ferenciková, 1998). This seems particularly true for the current downturn of the global economy.

We can illustrate the above motives using a few case studies from the Netherlands in the mechatronics sector (combined metal, electronics, optics, etc.) in the past years (*Table 4*). In most cases, the major motives are cost-based, namely low wages; sometimes this is related to a high level of skills.

Table 4 FDI by Dutch mechatronics companies

Case studies	Year, country, (city)	(1) Motives. (2) Type of manufacturing. (3) Additional comments.
Company 1 (main supplier)	1992 Poland	(1) Low salaries. (2) Manufacturing of components. (3) Closed-down in 2002 due to low efficiency and increasing salaries. Already investment in China.
Company 2 (OEM)	1995, Czech Rep. (Brno)	(1) Low salaries, skilled labour force, and flexibility in labour market. (2) Manufacturing of entire product (microscopes).
Company 3 (main supplier)	1993, Czech Rep. (Brno)	(1) Low salaries and skilled labour force. (2) Manufacturing of components.
Company 4 (main supplier)	1997, Czech Rep. (near Brno)	(1) Low salaries. (2) Manufacturing of components.
Company 5 (main supplier)	1993, Poland (Polmor)	(1) Low salaries. (2) Manufacturing of components. (3) Serious plans to invest in China.

Source: original case studies by the authors.

Market motives in this particular manufacturing branch are of minor importance. The latter situation means a danger to the investments in CEEC if another development takes place, i.e. a gradual increase in wage levels. China is emerging as an attractive

alternative with a booming market and significantly lower wages. The only thing that hampers a shift of investments to China to date is lack of skills specific for the sector.

The case studies also indicate that if the investment is done by an Original Equipment Manufacturer (OEM) and the entire product is produced abroad, there is a large chance that local outsourcing takes place and that training by the investor is given to both the main factory and local suppliers. This phenomenon touches upon the regional embeddedness issue to be discussed in Section 6. The type of subsidiaries related to the dominant motives, the broader strategic context of FDI decisions and the consequences for learning regions are discussed in the remaining part of this section.

A useful typology of subsidiaries is given by Radosevic (1997) in which investment motives are combined with the technological deepening and type of integration of the factory into the (global) corporate network. Accordingly, a distinction can be made between offshore factories, sourcing factories, focused factories, trading companies, knowledge-based factories, and resource-based factories (extractor and processor type).

The most "primitive" cost-driven FDI is concerned with *offshore factories*, common in sectors like the clothing industry and electronics. A concentration of this type can be found in the western Czech Republic, on the border with Germany. The firms are export-processing and vertically integrated into German subcontracting networks, based upon low-wage and low-skill labour. These investments compare with the US-Mexico maquiliadora type (Pavlínek and Smith, 1998). One step higher on the technology dimension are *sourcing factories*, very common in the automotive industry and also –as evident from our case-studies - in the mechatronics sector. With regard to the automotive industry, General Motors in Hungary is an example within a broader strategy of the mother company to develop lower-cost sources for the supply of components. The same holds for the Daewoo Electronics operation in Poland. Furthermore, there is now an increasing number of *focused factories*, with VW-Skoda in the Czech Republic, Suzuki Magyar in Hungary and the Polish Fiat factory as examples (Radosevic, 1997). The sourcing here includes a broad range of components or entire products, a situation in which foreign investment may also be attracted by local suppliers. Focused factories are integrated at a relatively high level in global corporate networks.

Regarding market-driven motives, *trading companies* are certainly the most common type. In practice, trading companies are often coupled with assembly plants to avoid high tariff barriers. Most market-based investments aim at capturing additional new markets in Central and Eastern Europe but there are various examples in which foreign investors have shut down the factories here to stop competition from the latter in Western European markets, eventually only leaving a trade organisation (e.g. Kiss, 1995; Bernard, 1996; Grayson and Bodily, 1996).

Knowledge-driven investments are still rare, but there are some examples in Russia linked with the military sector working through subcontracting and joint-ventures (such as in aerospace and aviation) and there are partly skills-driven investments, like in Slovakia, based on a traditionally high skill level in the weapons industry. Resource-based investments are more common, most of them being of the *extractors*

type. This type is found in Russia with its large reserves of oil and natural gas, and limited processing facilities, and also in Estonia with its vast amount of wood.

To date, it is not possible to assess the relative importance of the above types of foreign subsidiaries in transition economies. In investment studies a micro-perspective on subsidiaries has seldom been used in a systematic and comparative way, and this is reason why the current evidence is still fragmentary. Moreover, this importance also differs per manufacturing sector, such as between the food industry and electronics industry. The preliminary evidence suggests limited prospects for local learning and innovation, connected with offshore factories, sourcing factories, trading companies, and resource based-factories, all without any (autonomous) R&D activity (Rojec, 1994; Bernard, 1996; Radosevic, 1997; Smith and Ferencikova, 1998). Note that there are of course clearly positive aspects on a number of the above investments, i.e. the introduction of new technology and equipment critical for getting specific production from the ground - such as state-of-the-art equipment at green field oil and gas attraction sites by Shell in Russia (Sharp and Barz, 1996) - and the upgrading of existing facilities to modern best practice standards. In the latter cases the investors provide know-how, manufacturing facilities, tools, components and licences for plant reconstruction, and introduce new corporate and management cultures. In addition, as previously indicated, there is a recent growth of focused factories, mainly in the automotive industry (Radosevic, 1997). Through their larger scope of activities and stronger integration in the global industry, these factories provide relatively good potentials for local dynamic learning both on site and in local supply networks.

Aside from the type of subsidiary, ownership relations may play a role in learning and enhancing the innovative level of domestic factories. In general, joint ventures offer good opportunities for domestic partners to acquire western technology and derive new skills and management practices; however, there have been some important gradual take-overs of ownership shares of joint ventures by the foreign investor - such as in the Slovakia - thereby causing an increased isolation of the joint venture from its domestic partner (Smith and Ferenciková, 1998).

The picture indicated above is certainly not optimistic but it needs to be stressed that it is based on some snapshots. On the medium term, the subsidiaries may face a stronger technological deepening and integration at higher levels, while increasing on site R&D activity. We now move our attention to the broader context in which important conditions are set for learning and innovation: the national innovation system.

5. Systems of Innovation

In western economies, innovation is a process taking place in companies and between companies in networks, such as with suppliers, customers, and with universities and other knowledge institutes (Lundvall, 1995; OECD, 1996b). In this context, innovation is primarily an interactive and socially embedded process, including both interpersonal relationships dominated by informal communication and formal relationships using codified procedures and scientific language (e.g. Storper, 1996).

The current systems of innovation in Central and Eastern Europe are still influenced by the features of the communist past (Dyker and Perrin, 1997). First, there were weak

links between research institutes and companies, and concomitantly between research and the market. For example, in the former Soviet Union, science and technology were traditionally carried out in branch research institutes, being extensions of the appropriate ministries. These institutes responded to pressures from the hierarchy and were relatively isolated from the users of their findings (Egorov, 1996). In addition, in many countries the Academy system made a large contribution to basic and applied research, similarly in relative isolation from companies causing an almost absence of the essential notion of design (Dyker and Perrin, 1997). By contrast, in western economies large user-firms play a major role in interactively developing and modifying production equipment, as does the network of small specialised suppliers. Secondly, in the communist past the scarce links between research institutes and companies were concerned with different concepts of technological progress compared to the Schumpeterian definition of innovation (cf. Egorov, 1996; Imre and Varszegi, 1996). Progress used to be defined in terms of either increase of unit capacities of existing equipment or re-invention (imitation) of western consumer goods. A third important feature at that time was the absence of notions of interactive technology transfer and innovation processes. Thus, the acquisition of new technology was seen as a one-way process while it was overlooked that the success in acquisition of new technology critically depends on the capacity of the recipient firms to develop its own technology (e.g. Bell, 1997).

Today, one of the important potential players in future innovation networks, i.e. the old R&D institutes, is facing a process of deep restructuring. There is a shift from complex, technology-led projects towards simpler, market-oriented R&D and services like testing, quality control, and certification (Radosevic, 1995; Egorov, 1996). Thus, R&D institutes develop towards non-R&D and service organisations through privatisation and establishment of new companies (spin-off), or they undertake internal restructuring and attempt to create new relationships with R&D in companies, independent institutes, and universities. However, each direction seems to be fraught with difficulties. There is a danger that spin-off companies are launched from aims to compensate for funding short-falls rather than from planning strategies including a careful selection of competitive products and markets (e.g. Oakey et al., 1996). Furthermore, an impediment to the transformation of R&D institutes seems to be the brain drain. Low wages and lack of orders (budget cuts) have caused an outflow of research workers to other sectors. More importantly, there is a hidden brain drain involving a combination of formal maintenance of the workplace in a scientific institute and the spending of most working time by R&D workers on alternative activities. Developments like these are likely to erode the base of R&D institutes in some countries.

Accordingly, there is a need for R&D to be carried out by industry or by institutes actively connected with industry. With the collapse of many large industrial conglomerates and the absence of typical western institutions in the public and private sector, attention in policy is increasingly drawn to the development of small and medium sized enterprises (SMEs) (e.g. EBRD, 1995; Bernard, 1996; OECD, 1996a). SMEs are seen as important vehicles to introduce innovation and competition in local markets and to provide demonstration effects. They also allow flexibility in uncertain environments and provide re-employment opportunities for displaced employees from the state sector (OECD, 1996a). The numbers of SMEs are now rapidly increasing in

most transition economies but there seems to be an emphasis on short-term (temporary) business requiring small capital investment, such as in trade and service activities.

The above circumstances indicate that regional production systems based on innovative products from endogenous forces could develop only in a limited number of cases. Examples of such rare cases are the car industry and weapons industry in former Czechoslovakia. Moreover, the critical institutional conditions for localised learning as identified in specific regions in Western Europe and North America (e.g. Morgan, 1997) could not develop under communist rule. The self-organisation of regional communities and the development of initiatives aimed at societal progress (different from the official party system) were often discouraged. Vertical structures or fragmentation prohibited the development of horizontal co-operation that allows for open and interactive learning in a frame of planning based on responsibility of local actors and based on flexibility. Although major changes have occurred, it is reasonable to assume that the institutional layer that supports the new developments is still relatively thin. It can be concluded that the creation of conditions that enhance a learning region development is still littered with stumbling blocks.

6. Regional Embeddedness

Recently, the attention in research has shifted to looking at the regional impact of FDI in terms of market and supplier links, and to analysis of causes of uneven embeddedness (Grabher, 1997; Radosevic, 1997; Hardy, 1998; Pavlínek and Smith, 1998; Smith and Ferenciková, 1998; van Geenhuizen, 2001). The number of case studies dealing with impacts of FDI in terms of regional linkages is now rapidly increasing. Results from these studies point to both positive and negative developments (Kiss, 1995; Sharp and Barz, 1996; Pavlínek and Smith, 1998). Negative developments include the crowding out of traditional linkages with local suppliers of inputs (raw material, ingredients, components), such as found in parts of the Hungarian food industry, with these inputs being replaced by imports (Kiss, 1995).

Positive developments occur if foreign investors act as organisers of a local supply base, make use of knowledge and skills and undertake action to bring these skills to a higher level. For example, FEI company (US, NL) in producing microscopes in Brno (Czech Republic) works with local suppliers, while providing training to further improve the local skills. On a larger scale, VW-Skoda in and around Mlada Boleslav (Czech Republic) has taken an active role in the establishment of its suppliers' network leading to a majority of VW-Skoda's purchases in the country. Particularly, supply integration - requiring the suppliers to join the assembly line to install the parts themselves - creates opportunities to increase local learning and innovation. In contrast, the situation in the Slovak VW-Skoda investment (Bratislava) is completely different. Local supplier relationships are relatively few here, causing a factory that is almost entirely disconnected from its regional environment (Pavlínek and Smith, 1998). Similar issues currently play in Trnava close by the Skoda-VW factory, based on large investments by French Peugeot Citroen (NRC-Handelsblad, September 23 2003). Local knowledge and skills are available here due to earlier production facility of ambulances in the city. It remains however, to be seen whether local supplier linkages will be developed based on existing networks, or components will be

imported from France or produced locally in Slovakia by French suppliers that have followed their major client.

The difference in embeddedness between the VW Skoda factory in the Czech Republic and the one in Slovakia can be explained as follows. First of all, the inherited production system was different. The Skoda factory in the Czech Republic had a tradition of skills and independent innovation with an established network of suppliers. In contrast, the Skoda factory in the Slovakia was a latecomer and became structured as a branch plant in the old system with limited autonomous production and R&D. Accordingly, the foreign investor has simply built upon an existing structure. Secondly, the existing supply structure matched with the investor's strategy, such as Just-in-Time production schemes. It appears that regional supply structures are usually not created anew by foreign investors whereas existing supply structures are truncated if investors cannot see advantages in using them. In the latter case, regional supply structures are replaced by internationalised systems of supply integration, leading to only modest opportunities for local learning and innovation (Pavlínek and Smith, 1998).

In conclusion, the analysis has revealed two conditions under which a high regional embeddedness develops, i.e. an existing and innovative supply system and a sufficient match between this system and the specific needs of the investors. Note that circumstances may change in a favourable or unfavourable direction with regard to knowledge spillovers in the region (Pavlínek and Smith, 1998).

7. Concluding Remarks

The analysis of FDI flow into Central and Eastern European countries presented in this study has produced the following results. The three largest countries, EU accession countries in 2004, have attracted the majority of FDI since 1989, i.e. Poland, the Czech Republic and Hungary. Presently, the Czech Republic attracts the largest amounts of FDI, with Poland in second position; however, such patterns are subject to change over time. One factor is a nearby completion of privatisation in particular countries (currently in Hungary), another factor is competition from alternative attraction points in the world. Currently, China is emerging as such an attraction point, driven by large market opportunities and relatively low wages compared with Central and Eastern Europe. Whereas institutional (and geographical) distance to the EU plays a role in the differentiation in FDI flows across Central and Eastern Europe, this factor is apparently not important anymore in the case of China.

In this study we also attempted to identify conditions favouring knowledge spillovers from FDI in the regional economies of Central and Eastern Europe. Our preliminary results indicate that to date FDI has a modest impact on the rise of such spillovers and connected processes of learning and innovation. Most investments to date seem to be in offshore factories, sourcing factories and trading companies, all facing low levels of independent technology development and weak linkages in the regional economy. Thus, the acquisition of western knowledge and regional absorption of this knowledge are no automatic by-products of FDI, thereby underlining the need for policy action. Policy action can follow two lines. The first line would focus on a general improvement of conditions to benefit from newly acquired knowledge, whereas the

second line would include various targeted policies to attract innovative investments that advance a high level of knowledge spillovers in the regional economy.

We observe important policy tasks for the national governments as follows. In order to benefit from newly acquired knowledge, there is a pressing need to continue to foster processes of domestic knowledge transfer and absorption, such as by establishing liaison offices at higher educational institutes and universities, and technology centres focusing on generic technologies (such as micro-electronics) (e.g. Imre and Varszegi, 1996). Such centres have been established recently in various countries, partially with the assistance of EU programs. Attention needs to be given to the operation of these centres and the development of active linkages with regional and national learning networks. In addition, a supporting policy needs to be developed towards R&D institutions in their transformation towards active players in learning networks. An equally important but more difficult task is to train domestic firms in how to innovate and generate new knowledge, because acquisition and absorption of external knowledge is very much dependent on the knowledge level that is available. This covers the entire spectrum of learning mechanisms, from formal R&D to learning-by-doing using tacit knowledge. It involves the learning of new routines but also a further de-learning of traditional routines. In addition, policy attention is necessary to better satisfy specific corporate needs following from the more risky nature of innovative activities. For example, it is important to establish a safe system of intellectual property rights (such as patent protection), a condition that matters in the pharmaceutical and advanced chemicals industry (Sharp and Barz, 1996). Finally, we address the use of generic tools to attract specific innovative industry. For example, the foreign investment agency Czechinvest attempts to attract innovative investments by offering incentives. So far, few national policies are selective in attempting to attract innovative activities.

There are three policy ingredients to be proposed to regional governments regarding the attraction of FDI to foster innovative supply structures in the regions. A first policy ingredient would be the improvement of skills of existing suppliers to satisfy the requirements of multinationals. This is mainly concerned to skills at the workplace level (western best practice) and management skills. A second but more difficult component would be to advance regional self-organisation and regional entrepreneurial initiatives that can interact with foreign investment projects (van Geenhuizen and Nijkamp, 1999). A good example in this respect is found in the region of Hungarian Székesfehérvár with a combination of a forward-looking local government, entrepreneurial initiatives, and a skilled labour force (Business Central Europe, June 1998). A third, and again difficult ingredient, would be to pursue specific policy action to ensure that knowledge of foreign companies spills over into the local and wider economy. A regulation policy may prevent the cutting of domestic supply chains, but the way of negotiation may be a better one. The previously discussed VW-Skoda investment in the Czech Republic seems to be a rare example in which the state was able to negotiate local content agreements (Pavlínek and Smith, 1998). Note that opportunities for negotiation may increase when existing suppliers are upgraded close to western standards.

With regard to regional (local) policies the following model may be used if adapted to specific local circumstances: the "free science park"; this is a combination of financial

incentives to attract innovative FDI and a knowledge interaction infrastructure connected with regional universities and/or R&D institutes that support expertise to be commercialised. Currently, various initiatives come close to this model. A careful monitoring of their operation is necessary to learn from their development, particularly to learn which knowledge interaction infrastructure is most productive.

The role of the above policies should, however, not be overestimated because some of them have a long lead-time, particularly the ones concerning institution building and upgrading of skills based on endogenous forces. Furthermore, there is still a lack of insights into the ways important processes work. Therefore, there is a need for solid comparative research to better underpin and monitor policy action.

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